The Effects of Race/Ethnicity, Income, and Family Structure on Adolescent Risk Behaviors

Robert W. Blum, MD, PhD, Trisha Beuhring, PhD, Marcia L. Shew, MD, MPH, Linda H. Bearinger, PhD, MS, Renée E. Sieving, PhD, RN, and Michael D. Resnick, PhD

ABSTRACT

Objectives. The study examined the unique and combined contributions of race/ethnicity, income, and family structure to adolescent cigarette smoking, alcohol use, involvement with violence, suicidal thoughts or attempts, and sexual intercourse.

Methods. Analyses were based on the National Longitudinal Study of Adolescent Health. A nationally representative sample of 7th to 12th graders participated in in-home interviews, as did a resident parent for 85.6% of the adolescent subjects. The final sample included 10 803 White, Black, and Hispanic 7th to 12th graders.

Results. White adolescents were more likely to smoke cigarettes, drink alcohol, and attempt suicide in the younger years than were Black and Hispanic youths. Black youths were more likely to have had sexual intercourse; both Black and Hispanic youths were more likely than White teens to engage in violence. Controlling for gender, race/ethnicity, income, and family structure together explained no more than 10% of the variance in each of the 5 risk behaviors among younger adolescents and no more than 7% among older youths.

Conclusions. Findings suggest that when taken together, race/ethnicity, income, and family structure provide only limited understanding of adolescent risk behaviors. (*Am J Public Health.* 2000; 90:1879–1884)

Numerous studies on adolescent risk behaviors note significant differences among racial/ethnic groups: highest cigarette and alcohol use is reported among White teens,[1–6] whereas earlier onset of intercourse has been consistently found among Black youths.[7–12] Racial/ethnic variations also have been reported for affective disorders,[10,12] violence,[13] and suicide attempts.[14,15] Discussing racial/ethnic differences in onset of sexual intercourse and pregnancy risk, Hofferth suggested that because Blacks are more likely to be poor, racial/ethnic differences may in fact reflect socioeconomic differences among groups.[16] The same perspective is echoed by Wilson.[17] Several other analyses linked poverty with pregnancy risk[6,16,17] and adolescent smoking.[1,18] Therefore, interest also has focused on family structure to explain weapon carrying,[19] sexual behaviors,[20] violence,[21] suicidality,[22] smoking,[23] and alcohol and drug use.[24–26]

To date, most population-based surveys of youths have been too limited in size to partial out the discrete contribution of key sociodemographic factors. As a result, certain questions have remained unanswered. Is race/ethnicity a proxy measure for poverty? Do young people of similar income levels but different racial/ethnic backgrounds behave in similar ways, or is race/ethnicity a measure of culture that independently influences behavior? Does family structure exert an influence on behavior beyond race/ethnicity and income?

The present analysis was guided by problem behavior theory,[27] in which individual, biological, behavioral, and personality factors interact with perceived and actual social environments, predisposing adolescents to, or protecting adolescents from, health risk behaviors, depending on the factors present.

We used the National Longitudinal Study of Adolescent Health (1) to explore the relative contribution of each of the 3 key demographic variables to adolescent risk behaviors (cigarette smoking, alcohol use, violence, suicidal behavior, and sexual intercourse) and (2) to examine these 3 variables in combination to explain the variability in each of the abovementioned adolescent risk behaviors.

Methods

National Longitudinal Study of Adolescent Health Research Design

The National Longitudinal Study of Adolescent Health has been described in detail elsewhere.[28] Briefly, 80 high schools were randomly selected from a national roster of high schools stratified by enrollment, region, urbanicity, type of school, and racial/ethnic mix. Subsequently, the largest feeder school (junior high or middle school) was selected when one existed; thus, a total of 134 schools (79% school response rate) participated.

From student rosters and youths who completed a separate in-school survey, 15 243 students, randomly sampled by sex within grade, were invited to participate in the in-home interviews. Of these, 12 105 (79.4%) completed 90-minute interviews. In addition to adolescent data, a resident parent was asked to complete a half-hour interview. All protocols were approved by institutional review boards.

When weighted, the sample is nationally representative of 7th- to 12th-grade adolescents in school in the United States. Of the 12 105 subjects, 1302 were removed from the sample for the following reasons: 533 (4.4%) had multiple invalid responses, and 769 (6.4%)

The authors are with the Adolescent Health Program, School of Medicine, University of Minnesota, Minneapolis. Linda H. Bearinger is also with the School of Nursing, University of Minnesota.

Requests for reprints should be sent to Robert W. Blum, MD, PhD, University of Minnesota, Box 721, 420 Delaware St, SE, Minneapolis, MN 55455 (e-mail: blumx001@tc.umn.edu).

This article was accepted May 8, 2000.

either did not have a resident parent or were of ethnicities other than the study groups. A final analytic sample of 10 803 remained.

Measures

Health-compromising behaviors. Sexual intercourse was a dichotomous variable, defined in the survey as ever having had vaginal intercourse. Cigarette smoking, alcohol use, and suicide risk were ordinally scaled composite measures, collapsed at the high end of the distribution to reduce skew. Involvement in cigarette smoking had 12 levels. Involvement in *weapon-related violence* was a scale of frequency of involvement in weapon use, weapon carrying, or incidents in which a weapon was used ($\alpha = .83$).

Race/ethnicity was determined by 3 self-report items: Hispanic identity (yes/no), racial/ethnic identity (check all that apply), and primary racial/ethnic identity if more than 1 race/ethnicity was marked. For the present analysis, 3 racial/ethnic categories were used: White, non-Hispanic (71.1%); Hispanic (12.6%); and Black, non-Hispanic (16.3%). The sample was 50.3% female and 49.7% male, with equal proportions in 7th to 8th, 9th to 10th, and 11th to 12th grades.

Income was defined as all sources of income, including public assistance, based on parent report and rounded to the nearest thousand dollars and then collapsed into a 6-category variable to normalize the distribution. Cases missing parent data on income were assigned the median value for their subgroup as defined by sex, race/ethnicity, family structure, welfare status, education, and, for Whites, region and urbanicity. To simplify the presentation of descriptive results, we further collapsed income into 3 levels.

Family structure was defined as 1- or 2-parent households on the basis of adolescent report.

The distribution of income in the final sample was somewhat higher than that reported in the 1992 National Health Interview Survey for families of youths aged 12 to 17 years,[27] although this difference may be largely a reflection of the school-based sampling frame in the current data set.[29] In other National Longitudinal Study of Adolescent Health analyses, in-school youths reported fewer health risk behaviors than did same-age youths who did not attend school.[29]

Analytic Methodology

Descriptive analyses. For descriptive analyses, risk behaviors were dichotomized (Tables 2–4). Chi-square analyses of the dichotomized risk behavior variables determined significant group differences in the prevalence of high-risk behaviors.

Multivariate regression analyses. The multivariate regression analyses examined the relation between youth risk behaviors and each of the 3 demographic variables, controlling for the other 2 variables. Cigarette smoking, alcohol use, suicidal behavior, and interpersonal violence were treated as ordinally scaled continuous variables; sexual intercourse was a dichotomous outcome. Regression analyses were conducted with a robust variance estimator that adjusted SEs for the effects of the 2-stage stratified sampling design.[30] Analyses incorporated the sampling weights designed to make the in-home sample nationally representative of youths in grades 7 through 12.[29]

All regression analyses were stratified into grades 7 to 8 and grades 9 to 12. Logistic regressions for sexual intercourse were computed with and without control for age. Because the results were nearly identical, only the latter results are reported.

A hierarchical regression strategy was used in which the demographic variables were forced into the equation in a predetermined order: (1) gender alone; (2) the main effects of race/ethnicity, income, and family structure; and (3) the 2-way and 3-way interaction terms to determine whether they added significant explanatory power. Only results for the main effects models are reported, because models that included interaction terms did not significantly improve model fit.

The multivariate coefficient of determination (R^2) provided an estimate of the utility of each demographic variable in predicting variability in risk behavior.[30–32] For female sex, single-parent, Hispanic, and Black categories, the associated parameter estimates in the models represent the difference in average level of risk behavior for that group relative to the intercept term; for income, the parameter estimate represents the average change in level of risk behavior associated with each unit of increase in income after control for the effects of sex, race/ethnicity, and family structure.

Results

Nearly one quarter (22.6%) of the families had an income of $20 000 or less per year, nearly one third (32.7%) were in the middle-income group, and 44.5% had an income greater than $40 000. Whereas nearly two thirds (65.2%) of the adolescents in the lowest income group were from single-parent families, only 6.4% of those in the upper-income group were from single-parent homes.

It is not surprising that income and family structure were moderately interrelated ($r = -.44$). Specifically, 93.6% of the youths whose parents reported income of $40 000 or greater came from 2-parent families (86.3% of these were White, 7.2% Black, and 6.4% Hispanic). Conversely, two thirds of the respondents in the lower-income group were from single-parent families (43.1% of these were White, 38.6% Black, and 18.3% Hispanic).

Bivariate Analyses

Race/ethnicity and risk behaviors. White youths were between 1.5 and 2.5 times more likely to have smoked cigarettes in the past month than their Black or Hispanic peers (Table 1). Likewise, White high school students were nearly 50% more likely to drink alcohol in the past year as were Black teens, and they were significantly more likely to drink alcohol than were Hispanic teens. No significant racial/ethnic differences in suicidal thoughts

TABLE 1—Adolescent High-Risk Behavior, by Race/Ethnicity and School Grade

	7th–8th Grade, %			9th–12th Grade, %		
	White (n = 2627)	Hispanic (n = 453)	Black (n = 562)	White (n = 5057)	Hispanic (n = 902)	Black (n = 1176)
Smoked ≥1cigarette in past 30 days	19.2	13.9	12.2***	37.5	24.6	14.7***
Drank any alcohol in past 12 months	29.3	29.0	22.7**	60.9	53.5	42.7***
Suicidal thoughts or attempts	11.2	11.9	9.6	14.0	13.4	10.7**
Any weapon-related violence	21.6	30.5	39.3***	22.5	36.1	37.5*
Ever had sexual intercourse	10.8	16.1	36.9***	45.9	46.6	66.9***

Note. χ^2_2 test for the difference among 3 racial/ethnic groups on dichotomized risk behavior variables, stratified by grade category.
*$P < .05$; **$P < .01$; ***$P < .001$.

TABLE 2—Adolescent High-Risk Behavior, by Family Income and School Grade

	7th–8th Grade, %			9th–12th Grade, %		
	≤$20 000 (n = 964)	$21 000–$40 000 (n = 1261)	≥$41 000 (n = 1578)	≤$20 000 (n = 1532)	$21 000–$40 000 (n = 2505)	≥$41 000 (n = 3440)
Smoked ≥1 cigarette in past 30 days	19.0	18.6	15.6*	29.3	33.1	31.5*
Drank any alcohol in past 12 months	29.3	28.9	27.0	50.1	57.6	59.0***
Suicidal thoughts or attempts	11.5	12.9	9.3**	12.7	13.9	13.6
Any weapon-related violence	33.3	26.7	19.1***	35.3	29.5	20.9***
Ever had sexual intercourse	25.9	15.9	8.1***	57.4	53.7	41.1***

Note. χ^2_2 test for the difference among 3 income groups on the dichotomized risk behavior variables, stratified by grade category. Analyses conducted with the 6-level income variable produced the same pattern of results.
*$P < .05$; **$P < .01$; ***$P < .001$.

or attempts were found for younger teens; however, by high school, White and Hispanic youths were more likely to be at risk for suicidal thoughts or attempts than were their Black peers. In both middle and high school, a significantly greater proportion of Black and Hispanic youths than White youths reported engaging in weapon-related violence. Black teens were significantly more likely to have ever had sexual intercourse than were youths from the other 2 racial/ethnic groups. The differences were most pronounced for younger teenagers.

Income and risk behaviors. For cigarette smoking among younger teens, as income increased, cigarette smoking declined; however, for high school students, the trend was in the opposite direction (Table 2). Similarly, as income increased, drinking also increased among high school students. Suicide risk had an inverse relation with income during the younger years, but no differences were noted in high school. For both weapon-related violence and ever having had intercourse, a strong inverse relation with income was seen for every grade group analyzed.

Family structure and risk behaviors. Except for suicidal thoughts or attempts among younger adolescents, for every health risk behavior studied, adolescents who came from single-parent families were significantly more at risk than peers from 2-parent families (Table 3). The association was strongest for cigarette smoking and sexual intercourse across both grade groups and for drinking alcohol among younger teenagers.

Multivariate Analyses

Cigarette smoking. Among both younger and older teens, living in a single-parent home was associated with higher levels of smoking, even after control for income and race/ethnicity. Younger and older Black and Hispanic teens were less involved in cigarette smoking than were their White counterparts, even after control for family structure and income; racial/ethnic differences were most pronounced among older youth. Teens with higher levels of family income were somewhat less involved with cigarette smoking. Neither family income for high school students nor gender in either grade group was a significant predictor of involvement with smoking (Table 4).

Alcohol use. Among both grade groups, more frequent alcohol use was associated with living in a single-parent home, independent of income or race/ethnicity. Likewise, regardless of income or family structure, Black respondents were less involved with alcohol use than were their White counterparts, and among older teens Hispanic youths were less involved with alcohol than were White youths. Among older teens, females were less frequently involved with alcohol use than were males. Higher levels of family income were associated with somewhat more frequent alcohol use among older youths, even after control for family structure and race/ethnicity.

Weapon-related violence. Among both younger and older teens, females were less likely than males to be involved with violence. Likewise, those from higher income categories had less weapon-related violence regardless of family structure or race/ethnicity. For both grade groups, living in a single-parent household and being Black or Hispanic were associated with higher levels of involvement in violence, independent of income effects.

Suicide risk. Being female was associated with a greater risk for suicidal thoughts or attempts among both younger and older teens. Among older teens, there was a slight but statistically significant decrease in suicide risk as income rose. Additionally, suicide risk increased modestly among those from single-parent families, and risk significantly decreased among Blacks, especially those at the high school level.

Sexual intercourse. Higher income levels were inversely associated with a history of sexual intercourse after control for race/ethnicity and family structure. Coming from a single-parent home and being Black were positively associated with a history of sexual intercourse, regardless of income. The magnitude of each of these associations was larger among younger than older youths. Additionally, among younger teens, females were less likely than males to have initiated sexual intercourse; the same was not found for high school students.

The following questions remain: How much do race/ethnicity, income, and family structure, when taken together, truly contribute to the understanding of adolescent risk behaviors? How much explanatory power do these variables add over models that simply control

TABLE 3—Adolescent High-Risk Behavior, by Family Structure and School Grade

	7th–8th Grade, %		9th–12th Grade, %	
	Single Parent (n = 1161)	Two Parent (n = 2650)	Single Parent (n = 2345)	Two Parent (n = 5065)
Smoked ≥1 cigarette in past 30 days	21.4	15.6***	34.9	29.6***
Drank any alcohol in past 12 months	33.5	25.9***	58.7	55.4**
Suicidal thoughts or attempts	11.4	10.8	15.0	12.8**
Any weapon-related violence	32.7	22.0***	33.7	23.3***
Ever had sexual intercourse	23.8	11.2***	59.0	42.5***

Note. χ^2_1 test for the difference among 2 groups on the dichotomized risk behavior variables, stratified by grade category.
*$P < .05$; **$P < .01$; ***$P < .001$.

TABLE 4—Relation of Race/Ethnicity, Income, and Family Structure to Adolescent Risk Behaviors

Risk Behaviors	Parameter Estimates[a]					Variance Explained: Increase in R^2		
	Female	Income	Single Parent	Black	Hispanic	Gender	Race/Ethnicity, Income, Family	Total R^2
Cigarette smoking[b]								
7th–8th grade	NS	–0.10*	0.69***	–1.05***	–0.54***	.000	.041	.041
9th–12th grade	NS	–0.09*	0.87***	–2.41***	–1.32***	.000	.072	.072
Alcohol use[c]								
7th–8th grade	NS	NS	0.25***	–0.16**	NS	.000	.011	.011
9th–12th grade	–0.17***	0.07***	0.31***	–0.51***	–0.16*	.004	.023	.027
Weapon-related violence								
7th–8th grade	–0.57***	–0.07**	0.23***	0.29***	0.35**	.031	.027	.058
9th–12th grade	–0.90***	–0.06***	0.22***	0.47***	0.49***	.054	.027	.081
Suicide risk[d]								
7th–8th grade	0.11***	NS	NS	–0.05*	NS	.010	.004	.014
9th–12th grade	0.11***	–0.01*	0.04**	–0.07***	NS	.009	.004	.013
Ever had sexual intercourse								
7th–8th grade	–0.58***	–0.30***	0.40***	1.11***	NS	.009	.097	.106
9th–12th grade	NS	–0.08**	0.44***	0.58***	NS	.000	.029	.029

Note. NS = not significant.
[a]Risk behaviors were ordinally scaled variables, except for "ever had sexual intercourse."
[b]Never tried; experimental; former occasional or regular; former daily; occasional; transitional; light, moderate, and heavy regular; light, moderate, and heavy daily.
[c]Frequency of alcohol use had 6 levels (none in past year; 1–2 days and 3–12 days in past year; 2–3 days in past month; 1–2 days and ≥3 days in the past week).
[d]Extent of suicide risk had 5 levels (no suicidal thoughts or attempts in the past year; thoughts only; 1 attempt; 2 attempts; ≥3 attempts in the past year).
*P < .05; **P < .01; ***P < .001.

for the effects of gender? Only 4.1% of the variation in cigarette smoking among younger teens and 7.2% of the variation in smoking among older teens was explained by race/ethnicity, income, and family structure together. These 3 demographic variables explained only 1.1% of the variance in alcohol use among younger teens and 2.3% of the variance among older youths; less than 0.5% of the variance in suicide attempts among both grade groups; and only 2.7% of the variation in weapon-related violence among both younger and older teens. An analogue of R^2 for logistic regression[31] indicated that race/ethnicity, income, and family structure explained 9.7% of the variation in whether a younger teen had ever had sexual intercourse and 2.9% of the variability in sexual intercourse among older teens.

Discussion

Weapon-Related Violence

The present analyses found that both Black and Hispanic adolescents were more likely to report weapon-related violence than were White youths, even after control for income and family structure. These findings contrast with those of Vanderschmidt et al.,[13] who explored a variety of risk behaviors among youths in 2 schools in Boston, Mass, and found no differences in weapon carrying among Black and White adolescents. Vanderschmidt's study[13] focused on weapon *carrying* as a proxy for violence, whereas the current study examined violence *involvement*. However, Stark,[33] who studied homicide data in a national sample, came to the same conclusion as Vanderschmidt et al.[13]—namely, very little difference in violent behavior is seen between Blacks and Whites.

Given a strong correlation between race/ethnicity and poverty, it is reasonable to hypothesize that true differences in weapon-related violence are a function of income rather than race/ethnicity.[34] However, our findings suggest that income and race/ethnicity contribute separately to involvement with violence. For both younger and older adolescents, all income and race/ethnicity variables had significant, independent associations with violence. Whether this reflects a consequence of persistent social disadvantage,[35,36] a "culture of violence,"[36] or some combination of effects is untested.

Cigarette and Alcohol Use

Research has consistently shown higher rates of substance use among Whites. Multivariate analyses from the National Longitudinal Study of Adolescent Health confirmed those findings. Recent data on youth smoking from the Centers for Disease Control and Prevention showed the same pattern of racial/ethnic differences, despite the rising prevalence of cigarette smoking among adolescents in general and Black youths in particular.[37] Hanson[38] postulated that a set of factors accounts for racial/ethnic differences in cigarette smoking, including attitudes toward smoking, perceived behavioral control, and smoking intentions.

Bettes et al.[4] found that Hispanic youths are at especially high risk for alcohol abuse, but the current study challenges that conclusion. Bivariate analysis showed that Hispanic teens were consistently less likely to drink compared with White youths at older ages and no more likely to report drinking at younger ages. Likewise, multivariate analysis showed that Hispanic youths were at no higher risk for alcohol use outcomes, after control for gender, income, and family structure. Again, as suggested by Khoury et al.,[39] wide variations in use patterns among Hispanic subgroups may be masked in the current analyses for both alcohol and cigarettes.

Current findings suggesting consistently higher use of both cigarettes and alcohol among teens from single-parent families are relatively unique; Green et al.[23] found no relation between single-parent families and smoking patterns among British youths. Similarly, living in single-parent households was not a risk factor for alcohol use among Hispanic youths.[26]

Suicidal Thoughts or Attempts

Although concern over suicidality among both Hispanic[40] and Black youths[41] is rising, rates of suicide completion were significantly higher for White males than for other groups of adolescents. In the current study, no significant differences in prevalence of reported suicidal thoughts or attempts were found between Hispanic and White youths; however, Black youths were significantly less likely than peers to report suicidal thoughts or attempts. Likewise, only a weak income effect was seen in multivariate analyses and only among older teens. The risk, however, is to overstate racial/ethnic findings. After accounting for gender differences, multivariate analyses found little or no increased explanatory power in models that added race/ethnicity, income, and family structure variables. This finding suggests that we look within the more proximal social contexts of young people, including families and communities, to better understand what predisposes some young people to increased risk of suicide.

Sexual Intercourse

Stanton et al.[42] reported a median age at sexual debut of 11 years among Black adolescents. Although Norris et al.[43] challenged much of the comparative data as biased because of sample selection issues, national data sets confirm racial/ethnic differences. Carvajal et al.[44] used a survival analysis and found that being male and being Black were both related to earlier initiation of sexual intercourse, whereas Upchurch et al.[45] found such an association only for Black males. The current multivariate findings provide further evidence that youths from low-income families, youths in single-parent families, and Black youths are more likely to have ever had sexual intercourse. This pattern is found among both younger and older teens independently of the confounding among these variables.

Whether earlier age at sexual debut among Black youths is the result of persistent poverty and learned behavior, as suggested by Geronimus and Korenman,[46] or a holdover from agrarian Southern culture, as suggested by Dash,[36] remains to be clarified. Perhaps, as Dash[36] and Brewster[47] argued, the social contexts of young, poor Blacks may determine age at sexual debut more than any other set of factors. Findings from the current study suggest that such may be the case for teens from various racial/ethnic and social backgrounds. Analyses within each racial/ethnic group examining associations between income and sexual debut produced the same pattern of findings; as income rose, the reporting of "ever had sexual intercourse" declined.

Conclusion

Traditional public health reports of adolescent health risk behaviors highlight between-group differences, with special attention often paid to race/ethnicity and family structure. Garcia Coll et al.[48] suggested that such statistical analyses tend to negatively portray minorities (whether single-parent or racial/ethnic) while only marginally advancing our understanding of the factors that contribute to the behaviors under study.

The current study tends to confirm that perspective. Specifically, some adolescent health risk behaviors appear to be disproportionately high among youths of color, lower-income adolescents, and those living in poverty, but these demographic factors do not predict youth health risk behaviors well. Although descriptive analyses are never meant to explain a phenomenon, they often become a vehicle for organizing its understanding. Thus, for example, racial/ethnic differences in teen pregnancy or weapon-related violence assume explanatory power. A small explained variance (R^2), as was found in the current analyses, suggests that knowing race/ethnicity, income, and family structure provides little predictive power at the individual level. Rather, the low R^2 indicates tremendous heterogeneity of outcomes within racial/ethnic groups, income strata, and family structures.[49,50]

Perhaps one of the factors that has made it difficult to address adolescent health problems in the United States is the focus on describing the problem through highlighting group differences and, when differences are found, concluding that we understand the primary contributing factors. In so doing, we run a high risk of building our interventions on variables that are not amenable to change and that, even if they were amenable to change, would not significantly alter behavioral outcomes. Rather, we must look at neighborhood, family, school, peer, and individual characteristics and how those characteristics interact within various demographic groups to truly understand the dynamics that contribute to specific risk behaviors and to develop effective strategies that reduce risk and improve outcomes for youths. □

Contributors

R. W. Blum conceptualized the overall research questions, defined the core variables for analysis, and drafted, revised, and finalized the paper. All authors were involved in the writing, editing, and approving of the final paper and in conceptualizing the data and interpreting the results. T. Beuhring had lead responsibility for data analysis and drafting the Methods section. R. E. Sieving helped to design the analytic methods used and was involved in the data analysis. R. E. Sieving, L. H. Bearinger, and M. D. Resnick developed the scales for the adolescent health risk behaviors used in the study.

Acknowledgments

This research was based on data from the National Longitudinal Study of Adolescent Health, a program project designed by J. Richard Udry (Principal Investigator) and Peter Bearman and funded by grant P01-HD31921 from the National Institute of Child Health and Human Development to the Carolina Population Center, University of North Carolina at Chapel Hill, with cooperative funding participation by the National Cancer Institute; the National Institute on Alcohol Abuse and Alcoholism; the National Institute on Deafness and Other Communication Disorders; the National Institute on Drug Abuse; the National Institute of General Medical Sciences; the National Institute of Mental Health; the National Institute of Nursing Research; the Office of AIDS Research, National Institutes of Health (NIH); the Office of Behavior and Social Science Research, NIH; the Office of the Director, NIH; the Office of Research on Women's Health, NIH; the Office of Population Affairs, Department of Health and Human Services (DHHS); the National Center for Health Statistics, Centers for Disease Control and Prevention, DHHS; the Office of Minority Health, Centers for Disease Control and Prevention, DHHS; the Office of Minority Health, Office of Public Health and Science, DHHS; the Office of the Assistant Secretary for Planning and Evaluation, DHHS; and the National Science Foundation. Persons interested in obtaining data files from the National Longitudinal Study of Adolescent Health should contact Jo Jones, Carolina Population Center, 123 W Franklin St, Chapel Hill, NC 27516-3997 (e-mail: jo_jones@unc.edu).

The authors wish to acknowledge the assistance of Clea McNeely, PhD, in helping to think through variable construction and analytic methods. Additionally, Linda Boche's attention to manuscript preparation throughout the multiple versions of this paper is greatly appreciated.

References

1. Escobedo G, Anda RF, Smith PF, Remington PL, Mast EE. Sociodemographic characteristics of cigarette smoking initiation in the United States. *JAMA.* 1900;264:1500–1556.
2. Barnes GM, Welte JW. Patterns and predictors of alcohol use among 7th–12th grade students in New York State. *J Stud Alcohol.* 1986;47:53–62.
3. Barnes GM, Welte JW. Adolescent alcohol use: subgroup differences and relations to other problem behaviors. *J Adolesc Res.* 1986;1:79–94.
4. Bettes BA, Dusenbury L, Kerner J, James-Ortiz S, Botvin GJ. Ethnicity and psychosocial factors in alcohol and tobacco use in adolescents. *Child Dev.* 1990;61:557–565.
5. Murray DM, Perry CL, O'Connell C, Schmid L. Seventh grade cigarette, alcohol and marijuana use: distribution in a north central US metropolitan population. *Int J Addict.* 1987;22:357–376.
6. Bachman JG, Wallace JM, O'Malley PM, Johnston LD, Kurth CL, Neighbors HW. Racial/ethnic differences in smoking, drinking and illicit drug use among American high school seniors, 1976–1989. *Am J Public Health.* 1991;81:372–377.
7. Mott FL, Fondell MM, Hu PN, Kowalski-Jones L, Menaghan EG. The determinants of first sex

by age in a high-risk adolescent population. *Fam Plann Perspect.* 1996;28:13–18.
8. Furstenberg FF Jr. Race differences in teenage sexuality, pregnancy and adolescent childbearing. *Milbank Q*. 1987;65(suppl 2):381–403.
9. Kahn JR, Hofferth SL, Kalsbeek W. National studies of teenage sexual activity: evaluating the comparability of three national surveys. *Demography.* 1988;25:189–204.
10. Ku L, Sonenstein FL, Pleck JH. Factors influencing first intercourse for teenage men. *Public Health Rep.* 1993;108:680–694.
11. Radziszewska B, Richardson JL, Dent CW, Flay BR. Parenting style and adolescent depressive symptoms, smoking and academic achievement: ethnic, gender and SES differences. *J Behav Med.* 1996;19:289–305.
12. Florenzano R. Chronic mental illness in adolescence: a global overview. *Pediatrician.* 1991;18: 141–149.
13. Vanderschmidt HF, Lang JM, Knight-Williams D, Vanderschmidt GF. Risks among inner-city young teens: the prevalence of sexual activity, violence, drugs and smoking. *J Adolesc Health.* 1993;14:282–288.
14. Vega WA, Gill AG, Zimmerman RS, Warheit GJ. Risk factors for suicidal behavior among Hispanic, African American and non-Hispanic white boys in early adolescence. *Ethn Dis.* 1993;3: 229–241.
15. Woods ER, Lin YG, Middleman A, Beckford P, Chase L, DuRant RH. The associations of suicide attempts in adolescents. *Pediatrics.* 1997; 99:791–796.
16. Hofferth S. Contraceptive decision-making among adolescents. In: Hofferth S, Hayes CP, eds. *Risking the Future: Adolescent Sexuality, Pregnancy and Childbearing*. Washington, DC: National Academy of Sciences; 1987:56–77.
17. Wilson WJ. *The Truly Disadvantaged*. Chicago, Ill: University of Chicago Press; 1987.
18. Stanton WR, Oei TP, Silva PA. Sociodemographic characteristics of adolescent smokers. *Int J Addict.* 1994;29:913–925.
19. Black MM, Ricardo IB. Drug use, drug trafficking and weapon carrying among low-income, African American, early adolescent boys. *Pediatrics.* 1994;93:1065–1072.
20. Young EW, Jensen LC, Olsen JA, Cundick BP. The effects of family structure on the sexual behavior of adolescence. *Adolescence.* 1991;26: 977–986.
21. Billingham RE, Gilbert KR. Parental divorce during childhood and the use of violence in dating relationships. *Psychol Rep.* 1990;63:1003–1009.
22. Garnefski N, Diekstra RF. Adolescents from one parent, stepparent and intact families: emotional problems and suicide attempts. *J Adolesc.* 1997; 20:201–208.
23. Green G, Macintrye S, West P, Ecob R. Do children of lone parents smoke more because their mothers do? *Br J Addict.* 1990;85:1497–1500.
24. Brody GH, Forehand R. Prospective associations among family form, family processes, and adolescent's alcohol and drug use. *Behav Res Ther.* 1993;31:587–593.
25. Sokol-Katz JS, Ulbrich PM. Family structure and adolescent risk-taking behavior: a comparison of Mexican, Cuban, and Puerto Rican Americans. *Int J Addict.* 1992;27:1197–1209.
26. Stroup-Benham CA, Trevino FM, Trevino DB. Alcohol consumption patterns among Mexican-American mothers and among children from single and dual-headed households: findings from HHANES, 1982–84. *Am J Public Health.* 1990; 80(suppl):36–41.
27. Jessor R. Successful adolescent development among youth in high-risk settings. *Am Psychol.* 1993;48:117–126.
28. Resnick MD, Bearman PS, Blum RW, et al. Protecting adolescents from harm: findings from the National Longitudinal Study on Adolescent Health. *JAMA.* 1997;278:823–832.
29. Bearman P, Jones J, Udry JR. *The National Longitudinal Study of Adolescent Health: Research Design*. Chapel Hill, NC: Carolina Population Center; 1997.
30. *Stata Statistical Software, Release 5.0 for Windows* [computer program]. College Station, Tex: Stata Corp; 1997.
31. Cohen B. *Logistic Regression Examples Using the SAS System*: *Version 6*. Cary, NC: SAS Institute Inc; 1995:67–72.
32. Venebles WN, Ripley BD. *Modern Applied Statistics With S-Plus*. London, England: Springer-Verlag; 1994:186–187.
33. Stark E. Rethinking homicide: violence, race and the politics of gender. *Int J Health Serv.* 1990; 20:3–26.
34. Gelles RJ. Child abuse and violence in single-parent families: parent absence and economic deprivation. *Am J Orthopsychiatry.* 1989;59: 492–501.
35. Grier WH, Cobbs PM. *Black Rage*. New York, NY: Bantam Books; 1968.
36. Dash L. *When Children Want Children*. New York, NY: William Morrow & Co; 1989.
37. Centers for Disease Control and Prevention. Tobacco use among high school students—United States, 1997. *MMWR Morb Mortal Wkly Rep* [serial online]. 1998;47(12):229–233. Available at: http://www.cdc.gov/epo/mmwr/mmwr.html.
38. Hanson MJ. The theory of planned behavior applied to cigarette smoking in African American, Puerto Rican and non-Hispanic white teenage females. *Nurs Res.* 1997;46:155–162.
39. Khoury EL, Warheit GJ, Zimmerman RS, Vega WA, Gil AG. Gender and ethnic differences in the prevalence of alcohol, cigarette, and illicit drug use over time in a cohort of young Hispanic adolescents in south Florida. *Women Health.* 1996;24:21–40.
40. Roberts RE, Chen R, Roberts CR. Ethnocultural differences and prevalence of adolescent suicide behaviors. *Suicide Life Threat Behav.* 1997;27: 208–217.
41. Shaffer D, Gould M, Hicks R. Worsening suicide rates in black teenagers. *Am J Psychiatry.* 1994; 151:1810–1812.
42. Stanton B, Li X, Black M, Galbraith J, Kaljee L, Feigelman S. Sexual practices and intentions among pre-adolescent and adolescent youths. *Pediatrics.* 1994;93:966–973.
43. Norris AE, Ford K, Shyr Y, Schork MA. Heterosexual experiences and partnerships of urban, low-income African American and Hispanic youth. *J Acquir Immune Defic Syndr Hum Retrovirol.* 1996;11:288–300.
44. Carvajal SC, Parcel GS, Banspach S, et al. Psychosocial predictors of delay of first sexual intercourse by adolescents. *Health Psychol.* 1999; 18:443–452.
45. Upchurch DM, Levy-Storms L, Sucoff CA, Aneshensel CS. Gender and ethnic differences in the timing of first sexual intercourse. *Fam Plann Perspect.* 1998;30:121–127.
46. Geronimus A, Korenman S. The socioeconomic consequences of teen childbearing reconsidered. *Q J Econ.* 1992;107:1187–1214.
47. Brewster KL. Neighborhood context and the transition to sexual activity among young black women. *Demography.* 1994;34:603–614.
48. Garcia Coll C, Lamberty G, Jenkins R, et al. An integrative model for the study of developmental competencies in minority children. *Child Dev.* 1996;67:1891–1914.
49. Abelson RP. A variance explanation paradox: when a little is a lot. *Psychol Bull.* 1985;97: 129–133.
50. O'Grady KE. Measures of explained variance: cautions and limitations. *Psychol Bull.* 1982;92: 766–777.